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(54) Title: A PROCESS FOR THE PRODUCTION OF ALKYLENE OXIDE USING A GAS-PHASE PROMOTER SYSTEM

(57) Abstract: An improved process for the manufacture of ethylene oxide through the epoxidation of ethylene using a catalyst comprising silver and at least one efficiency-enhancing salt of a member of a redox-half reaction pair. Added to the epoxidation reaction is a two-component gas-phase promoter system comprising a chlorine-containing component (for example ethyl chloride, methyl chloride, vinyl chloride and ethylene dichloride), and a nitrogen-containing component of nitric oxide and other compounds capable of generating under reaction conditions at least one gaseous efficiency-enhancing member of a redox-half reaction pair comprising NO, NO₂, N₂O₃ or N₂O₄. The amount of each component of said gaseous promoter is adjusted to maintain the ration of N* to Z* less than or equal to 1 wherein, N* is the nitric oxide equivalent in ppmv, ranging from 1 to 20 ppmv and Z* =ethyl chloride equivalent (ppmv) * 100 percent / ethane equivalent (mol percent) * 100 ranging from 5 to 40 ppmv.